



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

Research Brief: Geotechnical Design of Contained Aquatic Disposal Sites

Issue

Many Corps of Engineers Districts are now, or soon will be, using Contained Aquatic Disposal (CAD) sites for placement of contaminated sediments (e.g., New England, Norfolk, Los Angeles, Seattle). In the past, when CAD pits have been filled without geotechnical designs, difficulties were experienced in some cases. Problems with determining cap thickness due to rapid consolidation of the cap or mixing of the contaminated sediments with the cap due to lack of sufficient strength were reported in a demonstration CAD project in Boston Harbor. This led to reports in the public domain that the contaminated sediments were not successfully capped. CAD pits are existing or newly constructed depressions within the waterbody that are used to laterally confine contaminated dredged material below navigation depths. These pits range in depth from a few feet to 40 ft. Horizontal dimensions of the pits vary considerably, but some of the larger sites are on the order of 1,500 ft wide by 5,000 ft long. For many of the larger sites, the pits will be filled incrementally. That is, a smaller portion such as an end or a corner will be filled with contaminated sediments and capped. Subsequently, other sections of the pit will be used for CAD development. For both single use and sequential filling of CAD pits, it is essential that geotechnical issues be addressed in the design of the CAD project.

Research/Objectives

Research was essential to develop geotechnical design guidance for CAD projects so that the projects will function as sound engineering structures with behavior that can be quantified and accurately predicted. The objective of the Dredging Operations and Environmental Research (DOER) research was to develop geotechnical design criteria for CAD projects. A synthesis of existing practices was developed using data from Corps Districts and U.S. Army Engineer Research and Development Center, and from other data, findings, and experiences. Knowledge gaps and design deficiencies were identified. Methods and procedures for design of CAD projects were developed.

Results/Products

Research resulted in guidance for geotechnical design of

CAD pits that provide for the most efficient and stable capped disposal sites. This guidance will allow construction of space-efficient, cost-effective deposit sites with improved long-range integrity. The research also provided a means of quantifying and accurately assessing observed field performance. This research is completed.

- Technical Note DOER-N5 - Geotechnical Design Considerations for Contained Aquatic Disposal

Research Team

[J. E. Clausner](#) and L. T. Lee
U.S. Army Engineer Research and Development Center
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, Mississippi 39180-6199